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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,683	02/10/2004	Jennifer Hoyt Lalli	05500008US	7374

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EXAMINER	
TRAN, THAO T	
ART UNIT	**PAPER NUMBER**
1711	

MAIL DATE	DELIVERY MODE
08/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/774,683	LALLI ET AL.	
	Examiner	Art Unit	
	Thao T. Tran	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *69-88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *69-88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is in response to the Amendment filed on 5/23/2007.

2. Claims 69-88 are currently pending in this application. Claims 49-68 have been cancelled.

3. In view of the prior Office action, the 112 rejection of the claims has been withdrawn due to the amendments made thereto. However, the prior art rejections are maintained as set forth below.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 69-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Pat. 6,592,945).

Suzuki discloses a method of manufacturing a structure, comprising forming a layer of a crosslinkable polymer on a substrate, depositing metal nanoparticles on the polymer film, repeating the process multiple times to form a laminate of multilayers of the polymer and the nanoparticles, and curing the layers with heat or light (see Example 3; col. 2, ln. 57-59). The crosslinkable polymers include all the polymers as presently claimed (see col. 4, ln. 59-65). The nanoparticles include those recited in the instant claims, such as gold having an average diameter of 3 nm (see col. 3, ln. 14-19; Example 3).

The method employed by Suzuki to deposit the metal nanoparticles is sputtering or chemical vapor deposition, and not immersing. However, it would have been obvious to one of

ordinary skill in the art to employ immersion to deposit the metal particles because these deposition methods have been conventionally used and the choice of one process over another would have depended upon user's preference and intended use.

Although Suzuki does not specifically disclose the polymer layers to be abrasion resistant, since the reference uses the same polymers as recited in the instant claims, the layer would inherently be abrasion resistant as presently claimed.

6. Claims 69-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Natan et al. (US Pat. 6,624,886), Natan et al. (US Pat. 6,242,264), or Natan et al. (US Pat. 6,025,202) in view of Meisenburg et al. (US 2004/0235997) or Suzuki et al. (US Pat. 6,592,945).

Natan '886 discloses a method for making a film of Au nanoparticles, the method comprising forming a monolayer of Au nanoparticles on a glass substrate coated with APTMS or MPTMS; immersing the monolayer in a crosslinker, 2-mercaptoethylamine. The surface is then immersed in a solution of Au nanoparticles for one hour. The process is repeated between 3-8 times, thus forming multilayers of the Au nanoparticles and the crosslinker. (See col. 4, ln. 53-60; col. 15, ln. 41-46; Example 6).

Natan '886 further discloses that the Au nanoparticles can be coated with an organic or inorganic polymer (see col. 5, ln. 56-60). However, Natan '886 does not specify the type of polymer nor the curing step of the polymer to form an abrasion resistant layer.

Natan '264 and Natan '202 each disclose a method for producing a nanocomposite film, comprising forming a multilayer on a substrate; wherein the substrate is coated with an organosilane and the multilayer further includes Au colloid monolayers alternating with layers of 2-mercaptoethylamine as a bifunctional crosslinker. The colloidal Au solution contains Au

particles and APTMS (see Natan '264, col. 38, ln. 43-53; Natan '202, col. 37, ln. 37-47), which reads on the presently claimed abrasion resistant resin.

However, neither Natan '264 nor Natan '202 discloses the step of curing the abrasion resistant resin.

Meisenberg teaches a coating material comprising nanoparticles modified with a siloxane resin, which is cured by actinic radiation to undergo polymerization and crosslinking, for the purpose of enhancing heat and yellowing stability and moisture resistance (see abstract; paragraphs 0027, 0037, 0041, 0046, 0048). Therefore, it would have been obvious to one of ordinary skill in the art, to have employed the nanoparticles modified with a siloxane resin of Meisenberg in the invention of the Natan references, to improve heat and yellowing stability of the nanocomposite film.

Suzuki discloses a laminate comprising layers of Au nanoparticles and polysiloxane polymer, wherein the polymer is cured by heat or light, to provide diffusion suppression of the nanoparticles (see Example 3; col. 2, ln. 57-59). Therefore, it would have been obvious to one of ordinary skill in the art, to use the polysiloxane layers of Suzuki in the invention of Natan references, to improve dispersion of the nanoparticles in the polymer layers. Although Suzuki does not specifically disclose the polymer layers to be abrasion resistant, since the reference uses the same polymers, the layers would inherently be abrasion resistant as presently claimed.

Response to Arguments

7. Applicant's arguments filed on 5/23/2007 have been fully considered but they are not persuasive.

In response to Applicants' argument that there is no motivation or suggestion to modify the Suzuki '945 reference, it is noted that sputtering, CVP, and immersion have been conventionally used in the art of metal deposition, and the choice of one process over another would have been dependent upon user's preference and intended use.

The same arguments are presented with respect to the Declaration.

In response to Applicants' argument that Suzuki does not teach an abrasion resistant matrix, it is noted that since the reference uses the same polymer layer, the layer would inherently have the same properties such as abrasion resistance as presently claimed.

With respect to Applicants' argument regarding the combined Natan references and Meisenbur, the same response is maintained and reiterated herein. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Natan references disclose the nanoparticles being coated with organic or inorganic polymer. Miesenberg is used to illustrate that the use of a coating material comprising nanoparticles modified with a siloxane resin has been taught in the prior art. Suzuki is used to illustrate that a laminate comprising layers of metal nanoparticles and polysiloxanes polymer have been taught in the prior art. Thus, Miesenberg and Suzuki are used to remedy the Natan references.

The same arguments apply to the combined Natan and Suzuki.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao T. Tran whose telephone number is 571-272-1080. The examiner can normally be reached on Monday-Friday, from 9:00 a.m. - 5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thao Tran

Thao T. Tran
Primary Examiner
Art Unit 1711

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